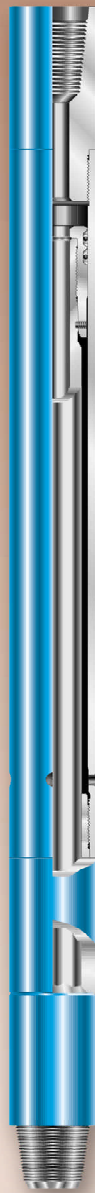


FISHING BUMPER SUBS

Instruction Manual 4460



Fishing Bumper Subs

One Company Unlimited Solutions

NOV NATIONAL OILWELL VARCO

Fishing Bumper Subs

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The designs and specifications for the tools described in this instruction manual were in effect at the time this manual was approved for printing. National Oilwell Varco, whose policy is one of continuous improvement, reserves the right to discontinue models at any time, or to change designs and specifications without notice or without incurring obligation.

Twentieth Printing, September 2005

General Description

The **Bowen Fishing Bumper Sub** was designed to provide a relatively inexpensive yet durable bumper sub for use in all fishing operations. Made from high grade, heat-treated alloy steels, it has the strength to perform sustained bumping operations with a minimum of maintenance.

Use

The Bowen Fishing Bumper Sub is used in all types of fishing operations. Normally made up in the string just above the fishing tool and /or safety joint, the Bowen Fishing Bumper Sub can, at the will of the operator, deliver solid downward blows or solid upward blows.

The Bowen Fishing Bumper Sub may be used as a "feed-off" tool in the "Predetermined Weight" Method of internal pipe cutting described in the Bowen Internal Cutter Instruction Manual No. 5600.

Construction

The Bowen Fishing Bumper Sub consists of a Mandrel, a Mandrel Body, Middle Body, Knocker, Top Sub and Seal Assembly. All principal parts are manufactured from high strength, heat-treated alloy steel, enabling the tool to withstand the severe bumping, tension and torque to which it will be subjected.

The hexagon shaped Mandrel fits into a correspondingly shaped Mandrel Body, where it is free to move up and down over its stroke while continuously capable of transmitting torque. The Mandrel Body joins the cylindrical Middle Body. The Knocker, containing the packing rings, screws onto the top of the Mandrel. **(Note: Some Sizes are available with optional Chevron packing. See parts list.)**

The packing rings seal between the Middle Body and the Mandrel. The lower pin connection is on the Mandrel.

Operation

Examine the Bowen Fishing Bumper Sub to be sure that it is properly assembled, that all threaded connections are made up tightly and that it is the proper size for the hole diameter and the fishing string with which it is to be run. (See the Specification Table for dimensions, specifications and parts numbers, beginning on page 6.)

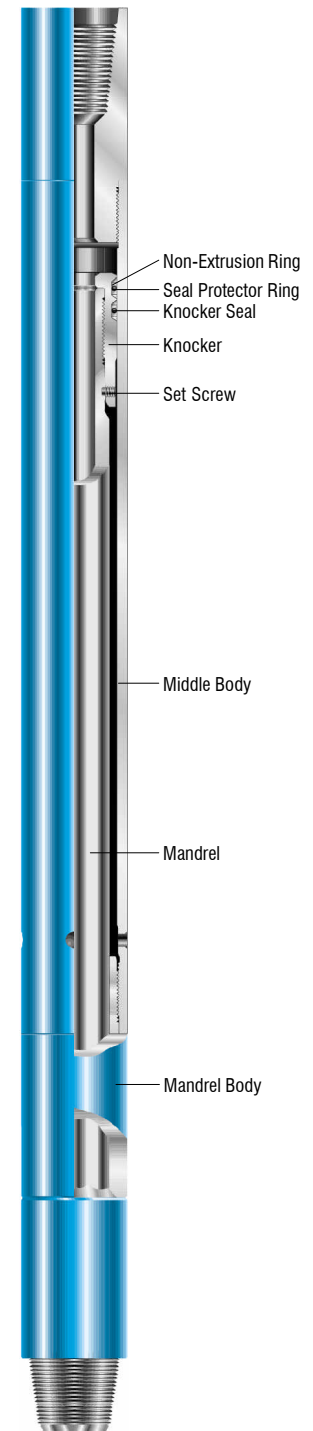
In Fishing Operations

The Bowen Fishing Bumper Sub is installed in the fishing string immediately above the fishing tool or safety joint. Its presence in the string enables the operator to release the fishing tool in the event it becomes impossible to pull the fish. The Bowen Fishing Bumper Sub will deliver the sharp downward blow (and transmit the torque) that is required to release it from the fish.

To Bump Down in the Hole

Elevate the fishing string sufficiently to open the Bowen Fishing Bumper Sub completely and to take a strain or stretch in the string. This will be the length of the stroke plus the permissible stretch in the fishing string.

Drop the fishing string sharply (to within 6 inches of the closed position of the sub) and stop it abruptly with the brake. If sufficient stretch has been taken in the fishing string, this will cause the lower end of the fishing string to spring downward, closing the Bowen Fishing Bumper Sub and, due to the elasticity of the string, deliver a series of downward blows to the tool below the sub.



Fishing Bumper Sub

To Bump a Solid Downward Blow in the Hole

Elevate the fishing string to open the Bowen Fishing Bumper Sub completely plus a moderate strain or stretch in the string. This will be the length of the stroke plus the permissible stretch of the string.

Drop the fishing string sharply this full length, without braking. This will cause the Bowen Fishing Bumper Sub to close quickly! The lower end of the Mandrel Body will strike the shoulder on the lower end of the Mandrel, transmitting a single solid downward blow to the tool below.

To Jar Up in the Hole

Elevate the fishing string sufficiently to stretch it moderately. Then drop the fishing string a distance equal to the stretch taken only, and stop it abruptly with the brake. This will cause the lower end of the string to spring downward, causing the Bowen Fishing Bumper Sub to close slightly, and then the string will rebound, causing the bumper sub to open quickly and the upper end of the Mandrel Body will strike the Knocker a solid upward blow.

To Bump a Solid Blow at the Surface in Order to Disengage a Fishing Tool

Leave a single or a drill collar above the Bowen Fishing Bumper Sub. Open the Bumper Sub sufficiently to install the head of sledge hammer between the Mandrel Body and the shoulder on the Mandrel. Slack off the elevators. Pull the sledge from between the Mandrel Body and the Mandrel shoulder. This will cause the Bowen Fishing Bumper Sub to close quickly and the lower end of the Mandrel Body will strike the shoulder of the Mandrel, delivering a solid, downward blow to the fishing tool and effecting a release of the fishing tool.

As a Feed-Off Tool

The Bowen Fishing Bumper Sub may be employed as a feed-off tool. In this operation, the Bowen Fishing Bumper Sub is installed in a cutting string a number of joints above a Bowen Internal Cutter. Since the Bumper Sub has a 20-inch stroke, the cutting string is picked up only 10 inches after the cutter is set, thus only the predetermined weight of the pipe between the cutter and the Bumper Sub is applied to the cutter, assuring a smooth operation of the cutter. (For more details, see Bowen Internal Cutter, Instruction Manual No. 5600.

Maintenance

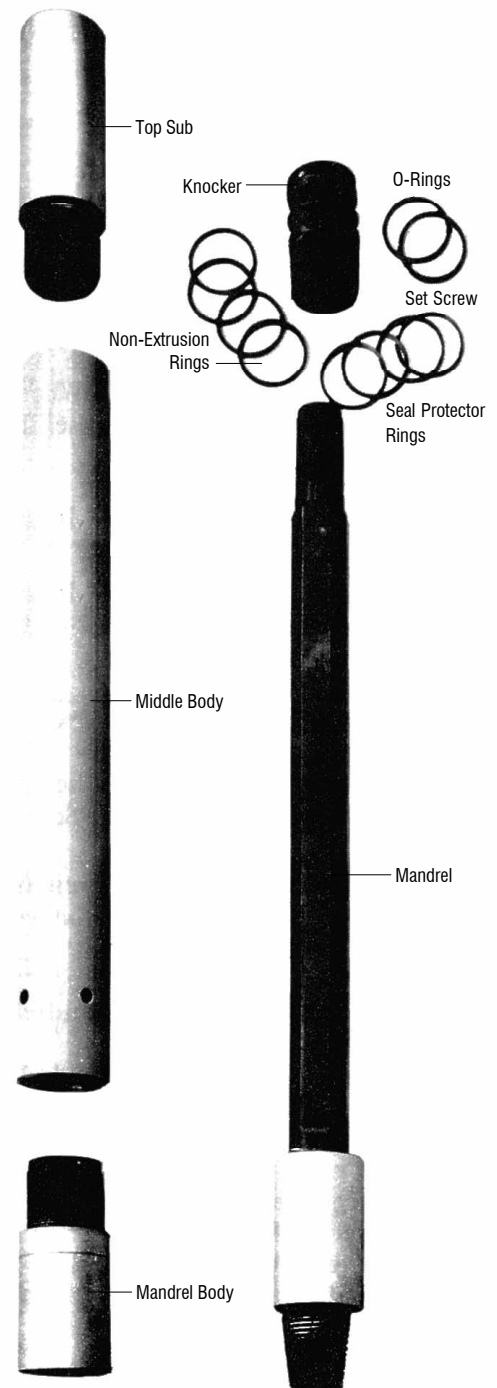
Due to its strong wear-resistant construction, only a minimum of maintenance is required; however, after each use the Bowen Fishing Bumper Sub should be washed clean of all drilling mud or other debris and then lubricated thoroughly to prevent deterioration. Seal Rings should be examined after each use for wear and damage. When damage is evident, the tool should be disassembled and the rings replaced.

Disassembly

1. Secure the Bowen Fishing Bumper Sub in a suitable vise, approximately in the middle of the Mandrel Body.
2. Remove the Top Sub.
3. Remove Middle Body from the Mandrel Body and remove Knocker Locking Screw.

CAUTION: Make sure Locking Screw is removed or backed-off prior to removing Knocker to prevent damage to Mandrel.

4. Remove Knocker from the Mandrel.
5. Remove Mandrel from the Mandrel Body.
6. Thoroughly clean all parts.



7. Inspect Kocker Seals, Non-Extrusion Rings and Seal Protector Rings; (or optional Chevron Packing by removing Retainer Ring and Packing Ring, see diagram on page 5); replace if worn or damaged.

8. Examine all metal parts for mars, scratches and upsets. Minor mars or scratches may be removed by hand filing or polishing with emery cloth. Badly damaged or badly upset parts must be replaced.

Reassembly

NOTE: Always lubricate the threads with an approved lubricant (KOPR-KOTE).

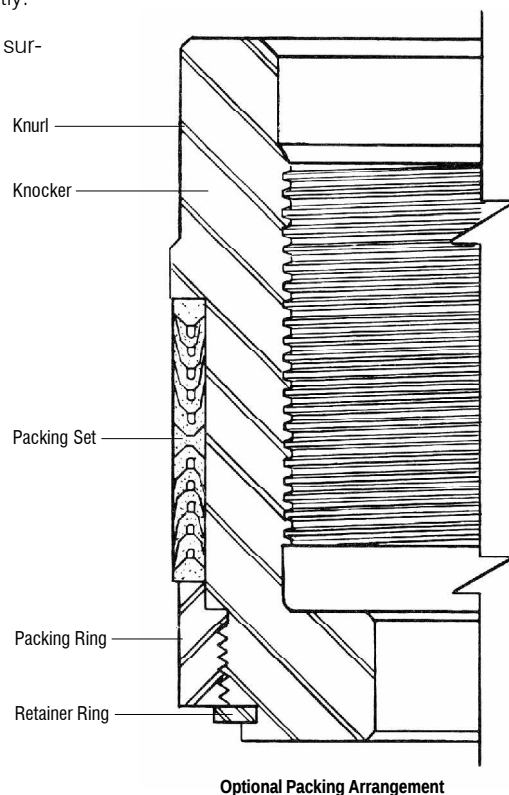
After all parts have been thoroughly cleaned and lubricated, all damaged parts repaired or replaced, the Bowen Fishing Bumper Sub may be reassembled as follows:

- 1.A. Replace Kocker Seals, starting with the lower groove.
 - a. Clean the grooves thoroughly, smoothing out any nicks or scratches with emery cloth.
 - b. Slide Non-Extrusion Ring over the Kocker with the bevel of the Ring matching the bevel of the groove. Do NOT expand the Ring more than absolutely necessary to pass over the Kocker O.D. Non-Extrusion Rings are heat-treated steel and will take an oversize set if expanded too far.
 - c. Install Seal Protector Ring in groove, next to the Non-Extrusion Ring.
 - d. Install O-Ring.
 - e. Install another Seal Protector Ring.
 - f. Install other Non-Extrusion Ring.
 - g. Repeat procedure on upper groove.

- 1.B. If packing is optional Chevron type, install as shown in diagram on page 5. Then reinstall Packing Ring and Retainer Ring.

Reminder: Lubricate all threads with KOPR-KOTE.

2. Secure Mandrel Body in a vise.
3. Slide Mandrel through the Mandrel Body.
4. Install Kocker on Mandrel and tighten. Install Locking Screw into Kocker making sure it bears on undercut provided in Mandrel.
5. Slide Middle Body over Mandrel and Kocker, taking care not to damage seals; then make up tightly to Mandrel Body.
6. Install Top Sub on the Middle Body. Make up all connections tightly.
7. Lubricate or paint all exterior surfaces before storing.



Optional Packing Arrangement

Strength Data - Bowen Fishing Bumper Subs

Maximum Recommended Tightening Torque for Threaded Connections						Strength Data	
Assembly No.	OD	ID	Sub Body to Middle Body (ft-lbs)	Mandrel Body to Middle Body (ft-lbs)	Knocker to Mandrel (ft-lbs)	Tensile Strength @ Yield (lbs)	Torque @ Yield (ft-lbs)
10120	1-13/16	3/8	510	510	220	68,720	1,020
21230	1-29/32	3/8	485	425	275	78,620	850
18785	2-1/4	1/2	665	1,220	785	172,900	2,440
10175	2-1/2	1/2	2,770	970	740	160,600	1,940
42592	3-1/8	1-1/2	1,650	1,650	1,160	158,600	3,300
10105	3-1/8	1	2,500	2,100	1,200	224,900	4,200
10190	3-3/8	1	2,870	2,870	1,770	256,000	5,740
39887	3-3/4	1-1/2	4,300	3,000	1,100	316,200	6,000
10090	3-3/4	1-1/4	4,705	4,705	1,875	268,500	9,400
39893	3-3/4	1-7/8	3,405	3,405	625	231,000	6,810
10210	4-1/8	1-1/2	5,600	4,635	2,060	370,200	9,270
36794	4-1/2	2-3/8	5,120	5,120	3,500	336,600	10,240
41824	4-1/4	1-15/16	6,010	4,600	2,700	305,000	9,200
10155	4-1/4	1-1/2	6,010	4,580	4,050	439,000	9,160
29556	4-5/8	1-7/8	7,265	6,720	4,160	442,000	13,440
10225	4-3/4	1-1/2	9,300	6,900	4,100	581,100	13,800
39905	4-3/4	2	7,600	4,100	4,500	465,900	8,200
39905	4-5/8	2	7,060	6,140	4,500	465,900	12,280
10235	5-1/2	2	11,035	11,035	8,550	613,400	22,070
10135	5-3/4	2	13,425	13,425	8,565	723,600	26,850
10135	6	2	19,675	14,745	8,565	767,000	29,490
10257	6-1/8	2-1/4	15,420	15,420	11,000	768,600	30,840
10257	6-1/4	2-1/4	19,000	19,000	11,000	864,400	38,000
10257	6-1/2	2-1/4	26,000	21,000	11,000	864,400	42,000
10690	6-3/4	2-3/4	18,800	18,800	10,000	871,000	37,600
26595	7-3/4	3-1/2	25,200	25,200	18,000	1,060,000	50,400
26595	8	3-1/2	34,800	27,300	18,000	1,060,000	54,600
61596	9	4	42,295	32,055	31,000	1,600,000	64,110

The above makeup torque values are the maximum recommended makeup torque for each connection. They are set at 50% of the calculated theoretical yield torque.

The tightening torque values were calculated assuming KOPR-KOTE, Itcolube, or similar zinc-based grease on all threads and shoulders.

The above tensile strengths are calculated theoretical yield strengths and should be considered accurate to $\pm 20\%$.

NOTE: The above tightening torques and strength values will typically apply for the same size tool with a different stroke. The standard stroke for Bumper Subs is 20 inches.

The figures do not constitute a guarantee, actual or implied; they are meant to serve as a guide only and appropriate allowance must be made in use as a safety factor.

Bowen Fishing Bumper Sub

		1-1/4	1"	1-1/4	2-3/8	2-3/8	2-3/8	2-3/8	2-3/8	2-7/8	2-3/8
Connection		EXT.	E.U.E.	A.P.I.	EXT.	E.U.E.	A.P.I.	A.P.I.	A.P.I.	A.P.I.	E.U.E.
		FL.	TBG.	REG.	FL.		REG.	I.F.	I.F.	REG.	
Outside Diameter - Inches		1-13/16	1-29/32	2-1/4	2-1/2	3-1/8	3-5/32	3-3/8	3-3/4	3-3/4	3-3/4
Inside Diameter - Inches		3/8	3/8	1/2	1/2	1-1/2	1	1	1-1/2	1-1/4	1-7/8
Stroke Inches		20	20	20	20	20	20	20	20	20	20
Complete Assembly	Part No.	10120	21230	18785	10175	42592	10105	10190	39887	10090	39893
20" Stroke	Weight	25	25	35	40	72	80	90	119	110	127

Replacement Parts

Top Sub	Part No.	10121	21231	18786	10176	42593	10106	10191	39888	10091	39894
	Weight	4	4	5	6	12	13	15	18	18	20
Mandrel Body	Part No.	10123	21233	18788	10178	42596	10108	10193	39890	10093	39896
	Weight	3	3	3	4	8	9	11	14	13	14
Middle Body	Part No.	10122	21232	18787	10177	42594	10107	10192	39889	10092	39895
20" Stroke	Weight	7	7	10	12	21	32	24	31	30	32
Mandrel	Part No.	10125	21234	18789	10180	42597	10110	10194	39891	10095	39897
20" Stroke	Weight	10	10	15	17	30	22	36	50	44	55
Knocker	Part No.	10126	21235	18790	10181	42595	10111	10195	39892	10096	39898
	Weight	2	2	2	2	3	4	4	5-1/2	5	6
Non-Extrusion Ring (4 Req'd.)	Part No.	385-22	385-22	385-27	387-2	216-34	387-6	385-35	216-38	385-37	216-38
Seal Protector Ring (4 Req'd.)	Part No.	386-22	386-22	386-27	388-2	227-34	388-6	386-35	272-38	386-37	227-38
Knocker Seal Ring (2 Req'd.)	Part No.	568217	568217	568222	568224	568331	568228	568332	568335	568334	568335
Knocker Lock Screw	Part No.	—	—	—	54775	—	48879	48879	48879	54769	54775
	Weight	—	—	—	1/8	—	1/8	1/8	1/8	1/8	1/8

Optional - Extra

Knocker Assembly W/ Chevron Packing (Fits All Strokes)	Part No.	—	—	—	—	—	—	—	—	30910	—
	Weight	—	—	—	—	—	—	—	—	—	—
Knocker	Part No.	—	—	—	—	—	—	—	—	30911	—
	Weight	—	—	—	—	—	—	—	—	—	—
Packing Ring	Part No.	—	—	—	—	—	—	—	—	30912	—
	Weight	—	—	—	—	—	—	—	—	—	—
Center Ring	Part No.	—	—	—	—	—	—	—	—	30913	—
	Weight	—	—	—	—	—	—	—	—	—	—
Chevron Packing Set	Part No.	—	—	—	—	—	—	—	—	30914	—
	Weight	—	—	—	—	—	—	—	—	—	—
Retaining Ring	Part No.	—	—	—	—	—	—	—	—	19812	—
	Weight	—	—	—	—	—	—	—	—	—	—
Packing Retainer (2 Req'd.)	Gals. Req.	—	—	—	—	—	—	—	—	62345	—
	Weight	—	—	—	—	—	—	—	—	—	—

How To Order:

Specify: (1) Complete assembly and part number
(2) Size connection
(3) Length of stroke

Recommended Spares:

(1) 8 Non-Extrusion Rings
(2) 8 Seal Protector Rings
(3) 16 Knocker Seals

Special Note: Standard Stroke for Bumper Subs is 20".
See pages 8, 10, and 12 for strokes greater than 20".

Bowen Fishing Bumper Sub (Continued) - Long Stroke (Greater Than 20") Assemblies

Connection		1-1/4	1"	1-1/4	2-3/8	2-3/8	2-3/8	2-3/8	2-7/8	2-3/8
		EXT. FL.	E.U.E. TBG.	A.P.I. REG.	EXT. FL.	E.U.E. REG.	A.P.I. I.F.	A.P.I. I.F.	A.P.I. REG.	E.U.E.
Outside Diameter - Inches		1-13/16	1-29/32	2-1/4	2-1/2	3-1/8	3-5/32	3-3/8	3-3/4	3-3/4
Inside Diameter - Inches		3/8	3/8	1/2	1/2	1-1/2	1	1	1-1/2	1-7/8
Complete	Part No.	29523	29526	29529	29532	46881	29535	29538	46863	29541
Assembly	Weight	33-1/2	33-1/2	47-1/2	54-1/2	101	107	120	160	147
30" Stroke*										
Mandrel	Part No.	29524	29527	29530	29533	46882	29536	29539	46864	29542
30" Stroke*	Weight	15	15	22	25	45	33	54	75	66
Middle Body	Part No.	29525	29528	29531	29534	46883	29537	29540	46865	29543
30" Stroke*	Weight	10	10	15	18	32	48	38	46	45
Complete	Part No.	29574	29577	29580	29583	46908	29586	29589	46890	25180
Assembly	Weight	44	44	65	75	117	140	159	184	192
36" Stroke										
Mandrel	Part No.	29575	29578	29581	29584	46909	29587	29590	46891	25182
36" Stroke	Weight	18	18	27	30	54	40	65	90	79
Middle Body	Part No.	29576	29579	29582	29585	46910	29588	29591	46892	25181
36" Stroke	Weight	12	13	18	22	39	58	45	55	54
Complete	Part No.	29619	29622	29625	29628	46935	16933	29643	46917	29646
Assembly	Weight	44	44	63	72	129	139	157	208	191
42" Stroke										
Mandrel	Part No.	29620	29623	29626	29629	46936	16935	29644	46918	29647
42" Stroke	Weight	21	21	31	36	60	46	75	105	92
Middle Body	Part No.	29621	29624	29627	29642	46937	16934	29645	46919	29648
42" Stroke	Weight	15	15	21	25	45	67	52	64	63
Complete	Part No.	29682	29685	29688	29691	46962	16936	29694	46944	29697
Assembly	Weight	49	49	70	81	148	156	175	236	214
48" Stroke										
Mandrel	Part No.	29683	29686	29689	29692	46963	16938	29695	46945	29698
48" Stroke	Weight	24	24	36	41	72	53	86	124	106
Middle Body	Part No.	29684	29687	29690	29693	46964	16937	29696	46946	29699
48" Stroke	Weight	17	17	24	29	52	77	60	73	72
Complete	Part No.	29748	29751	29754	29757	46989	29760	29763	46971	29766
Assembly	Weight	59	59	85	98	174	188	212	280	258
60" Stroke										
Mandrel	Part No.	29749	29752	29755	29758	46990	29761	29764	46972	29767
60" Stroke	Weight	30	30	45	51	90	66	108	150	132
Middle Body	Part No.	29750	29753	29756	29759	46991	29762	29765	46973	29768
60" Stroke	Weight	21	21	30	36	65	46	75	91	90

How To Order:

Specify: (1) Complete Assembly And Part Number
(2) Size Connection
(3) Length of Stroke

Recommended Spares:

(1) 8 Non-Extrusion Rings
(2) 8 Seal Protector Rings
(3) 16 Knocker Seals

Special Note: Standard Stroke for Bumper Subs is 20".

*Only the Mandrel and Middle Body need be ordered to convert a standard 20" stroke assembly to one of greater stroke. All other parts interchange, for a given size. When a long stroke Assembly is ordered by assembly number, the entire tool is ordered. To convert, order only the Mandrel and Middle Body, by number.

Bowen Fishing Bumper Sub (Continued)

		2-7/8	2-7/8	2-7/8	3-1/2	3-1/2	3-1/2	3-1/2	4-1/2
		A.P.I.	E.U.E.	A.P.I.	A.P.I.	A.P.I.	A.P.I.	A.P.I.	A.P.I.
		I.F.		I.F.	REG.	F.H.	F.H.	I.F.	REG.
Outside Diameter -inches		4-1/8	4-1/2	4-1/4	4-1/4	4-5/8	4-3/4	4-3/4	5-1/2
Inside Diameter - Inches		1-1/2	2-3/8	1-15/16	1-1/2	1-7/8	2	1-1/2	2
Stroke - Inches		20	20	20	20	20	20	20	20
Complete Assembly	Part No.	10210	36794	41824	10155	29556	39905	10225	10235
20" Stroke	Weight	140	152	140	165	190	200	210	270

Replacement Parts

Tob Sub	Part No.	10211	36795	41825	10156	25274	39906	10226	10236
	Weight	22	30	25	28	32	35	34	44
Mandrel Body	Part No.	10213	36797	10158	10158	25275	39908	10228	10238
	Weight	16	16	15	18	22	25	26	33
Middle Body	Part No.	10212	36796	10157	10157	29558	39907	10227	10237
	Weight	38	34	33	35	40	40	42	54
Mandrel	Part No.	10214	36798	41828	10160	29557	39909	10229	10239
	Weight	54	65	60	78	95	80	100	128
Knocker	Part No.	10215	36799	41829	10161	25273	39910	10230	10240
	Weight	6	7	6-1/2	7	9	9	9	12
Non-extrusion Ring (4 Req'd.)	Part No.	385-40	216-44.5	385-41	385-41	385-44	216-44	385-44	385-51
Seal Protector Ring (4 Req'd.)	Part No.	386-40	227-44.5	386-41	386-41	386-44	227-44	386-44	386-51
Knocker Seal (2 Req'd.)	Part No.	568337	568341	568338	568338	568341	568341	568341	568348
Knocker Lock Screw	Part No.	48879	48879	48879	48879	54769	48879	54769	43304
	Weight	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/4

Optional - Extra

Knocker Assembly									
W/Chevron Packing (Fits All Strokes)	Part No.	—	—	62774	59191	—	59177	—	—
	Weight	—	—	—	—	—	—	—	—
Knocker	Part No.	—	—	62775	59192	—	59178	—	—
	Weight	—	—	—	—	—	—	—	—
Packing Ring	Part No.	—	—	62776	59193	—	59179	—	—
	Weight	—	—	—	—	—	—	—	—
Center Ring	Part No.	—	—	62777	59194	—	59180	—	—
	Weight	—	—	—	—	—	—	—	—
Chevron Packing Set	Part No.	—	—	62778	59195	—	59181	—	—
	Weight	—	—	—	—	—	—	—	—
Retaining Ring	Part No.	—	—	59182	59196	—	59182	—	—
	Weight	—	—	—	—	—	—	—	—
Packing Retainer (2 Req'd.)	Part No.	—	—	62780	59197	—	59183	—	—
	Weight	—	—	—	—	—	—	—	—

How To Order:

Specify: (1) Complete Assembly and Part Number
(2) Size Connection
(3) Length of Stroke

Recommended Spares:

(1) 8 Non-Extrusion Rings
(2) 8 Seal Protector Rings
(3) 16 Knocker Seals

Special Note: Standard Stroke for Bumper Subs is 20".
See pages 8, 10, and 12 for strokes greater than 20".

Bowen Fishing Bumper Sub (Continued) - Long Stroke (Greater Than 20") Assemblies

Connection		2-7/8	2-7/8	2-7/8	3-1/2	3-1/2	3-1/2	3-1/2	4-1/2
		A.P.I.	E.U.E.	A.P.I.	A.P.I.	A.P.I.	A.P.I.	A.P.I.	A.P.I.
		I.F.		I.F.	REG.	F.H.	F.H.	I.F.	REG.
Outside Diameter - Inches		4-1/8	4-1/2	4-1/4	4-1/4	4-5/8	4-3/4	4-3/4	5-1/2
Inside Diameter - Inches		1-1/2	2-3/8	1-15/16	1-1/2	1-7/8	2	1-1/2	2
Complete	Part No.	29547	46875	46872	29553	29559	46878	29562	29571
Assembly	Weight	186	200	186	222	258	250	281	361
30" Stroke									
Mandrel	Part No.	29548	46876	46873	29554	29560	46879	29563	29572
30" Stroke	Weight	81	97	90	117	143	120	150	192
Middle Body	Part No.	29549	46877	46874	29555	29561	46880	29564	29573
30" Stroke	Weight	57	49	48	53	60	60	63	81
Complete	Part No.	29595	46902	46899	25185	29601	46905	29604	29607
Assembly	Weight	213	229	23	257	298	286	324	415
36" Stroke									
Mandrel	Part No.	29596	46903	46900	25187	29602	46906	29605	29608
36" Stroke	Weight	97	117	108	142	171	144	180	230
Middle Body	Part No.	29597	46904	46901	25186	29603	46907	29606	29609
36" Stroke	Weight	68	58	57	63	72	72	76	97
Complete	Part No.	29652	46929	46926	29658	25270	46932	29661	29664
Assembly	Weight	242	258	240	290	339	322	466	471
42" Stroke									
Mandrel	Part No.	29653	46930	46927	29659	25272	46933	29662	29665
42" Stroke	Weight	114	137	126	164	200	168	210	269
Middle Body	Part No.	29654	46931	46928	29660	25271	46934	29663	29666
42" Stroke	Weight	80	67	66	74	84	84	188	114
Complete	Part No.	29703	46956	46953	29709	29712	46959	29715	29718
Assembly	Weight	269	286	267	323	379	358	409	523
48" Stroke									
Mandrel	Part No.	29704	46957	46954	29710	29713	46960	29716	29719
48" Stroke	Weight	130	156	144	187	228	192	240	307
Middle Body	Part No.	29705	46958	46955	39711	29714	46961	29717	29735
48" Stroke	Weight	91	76	75	84	96	96	101	130
Complete	Part No.	29772	46983	46980	29778	29781	46986	29781	29787
Assembly	Weight	324	343	321	391	460	430	494	634
60" Stroke									
Mandrel	Part No.	29773	46984	46981	29779	29782	46987	29782	29788
60" Stroke	Weight	162	195	180	234	285	240	300	384
Middle Body	Part No.	29774	46985	46982	29780	29783	46988	29783	29789
60" Stroke	Weight	114	94	93	105	120	120	126	162

How To Order:

Specify: (1) Complete Assembly and Part Number
(2) Size Connection
(3) Length of Stroke

Recommended Spares:

(1) 8 Non-Extrusion Rings
(2) 8 Seal Protector Rings
(3) 16 Knocker Seals

Special Note: Standard Stroke for Bumper Subs is 20".

*Only the Mandrel and Middle Body need be ordered to convert a standard 20" stroke assembly to one of greater stroke. All other parts interchange, for a given size. When a long stroke Assembly is ordered by assembly number, the entire tool is ordered. To convert, order only the Mandrel and Middle Body, by number.

Bowen Fishing Bumper Sub (Continued)

Size Connections		4-1/2	4-1/2	4-1/2	4-1/2	5-1/2	6-5/8	6-5/8	7-5/8
		A.P.I.	A.P.I.	A.P.I.	A.P.I.	A.P.I.	A.P.I.	A.P.I.	A.P.I.
		F.H.	F.H.	I.F.	I.F.	REG.	REG.	REG.	REG.
Outside Diameter - Inches		5-3/4	6	6-1/8	6-1/4	6-3/4	7-3/4	8	9
Inside Diameter - Inches		2	2	2-1/4	2-1/4	2-3/4	3-1/2	3-1/2	4
Stroke - Inches		20	20	20	20	20	20	20	20
Complete Assembly	Part No.	10135	10135	10257	10257	10690	26595	26595	61596
20" Stroke	Weight	295	334	355	370	455	620	913	

Replacement Parts

Top Sub	Part No.	10136	10136	10258	10258	10691	26596	26596	61597
	Weight	51	54	56	60	74	90	98	185
Mandrel Body	Part No.	10138	10138	10267	10267	10693	26598	26598	61599
	Weight	36	39	44	50	57	83	91	80
Middle Body	Part No.	10137	10137	10262	10262	10692	26597	26597	61598
	Weight	60	80	80	76	88	115	125	185
Mandrel	Part No.	10140	10140	10268	10268	10694	26599	26599	61600
	Weight	138	135	155	168	210	300	330	420
Knocker	Part No.	10141	10141	10250	10250	10695	26594	26594	61601
	Weight	13	13	15	15	22	30	30	42
Non-extrusion Ring (4 Req'd.)	Part No.	385-52	385-52	385-54	385-54	385-58	385-65	385-65	216-68.5
	Weight	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
Seal Protector Ring (4 Req'd.)	Part No.	386-52	386-52	386-54	386-54	386-58	386-65	386-65	227-68.5
	Weight	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
Knocker Seal (2 Req'd.)	Part No.	568349	568349	568427	568427	568431	568438	568438	568441
	Weight	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
Knocker Lock Screw	Part No.	43305	43305	43305	43305	43305	43305	43305	54770
	Weight	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4

Optional - Extra

Knocker Assembly W/Chevron Packing (Fits All Strokes)	Part No.	50321	—	—	62205	57013	61103	—	—
	Weight	—	—	—	—	—	—	—	—
Knocker	Part No.	50322	—	—	62206	57014	61104	—	—
	Weight	—	—	—	—	—	—	—	—
Packing Ring	Part No.	50323	—	—	62207	57015	61105	—	—
	Weight	—	—	—	—	—	—	—	—
Center Ring	Part No.	50324	—	—	62208	62374	62378	—	—
	Weight	—	—	—	—	—	—	—	—
Chevron Packing Set	Part No.	50325	—	—	62209	57016	61106	—	—
	Weight	—	—	—	—	—	—	—	—
Retaining Ring	Part No.	50326	—	—	13177	57017	59907	—	—
	Weight	—	—	—	—	—	—	—	—
Packing Retainer (2 Req'd.)	Part No.	50009	—	—	62210	62375	62379	—	—
	Weight	—	—	—	—	—	—	—	—

How To Order:

Specify: (1) Complete Assembly and Part Number
(2) Size Connection
(3) Length of Stroke

Recommended Spares:

(1) 8 Non-Extrusion Rings
(2) 8 Seal Protector Rings
(3) 16 Knocker Seals

Special Note: Standard Stroke for Bumper Subs is 20".
See pages 8, 10, and 12 for strokes greater than 20".

Bowen Fishing Bumper Sub (Continued) - Long Stroke (Greater Than 20") Assemblies

		4-1/2	4-1/2	4-1/2	4-1/2	5-1/2	6-5/8	6-5/8	7-5/8
Size Connections		A.P.I.	A.P.I.	A.P.I.	A.P.I.	A.P.I.	A.P.I.	A.P.I.	A.P.I.
		F.H.	F.H.	I.F.	I.F.	REG.	REG.	REG.	REG.
Outside Diameter - Inches		5-3/4	6	6-1/8	6-1/4	6-3/4	7-3/4	8	9
Inside Diameter - Inches		2	2	2-1/4	2-1/4	2-3/4	3-1/2	3-1/2	4
Complete Assembly 30" Stroke	Part No.	16150	16150	20005	20005	14520	29568	29568	70408
	Weight	394	400	473	443	606	805	860	1178
Mandrel 30" Stroke	Part No.	16151	16151	20007	20007	14522	29569	29569	70410
	Weight	207	158	233	196	315	450	480	611
Middle Body 30" Stroke	Part No.	16152	16152	20006	20006	14521	29570	29570	70409
	Weight	90	122	120	101	134	165	175	259
Complete Assembly 36" Stroke	Part No.	10147	10147	29610	29610	13590	26916	29616	70411
	Weight	454	442	543	475	693	928	983	1341
Mandrel 36" Stroke	Part No.	10149	10149	29611	29611	13592	29617	29617	70413
	Weight	249	175	279	213	378	540	570	725
Middle Body 36" Stroke	Part No.	10148	10148	29612	29612	13591	29618	29618	70412
	Weight	108	148	144	116	158	198	208	308
Complete Assembly 42" Stroke	Part No.	29667	29667	29670	29670	29676	29679	29679	70414
	Weight	513	483	613	508	783	1051	1106	1505
Mandrel 42" Stroke	Part No.	29668	29668	29671	29671	29677	29680	29680	70416
	Weight	290	191	325	230	420	630	660	840
Middle Body 42" Stroke	Part No.	29669	29669	29672	29672	29678	29681	29681	70415
	Weight	126	173	168	132	185	231	241	357
Complete Assembly 48" Stroke	Part No.	19880	19880	29736	29736	29742	29745	29745	70417
	Weight	572	525	684	555	871	1174	1229	1643
Mandrel 48" Stroke	Part No.	19881	19881	29737	29737	29743	29746	29746	70419
	Weight	331	206	372	247	503	720	730	929
Middle Body 48" Stroke	Part No.	19882	19882	29738	29738	29744	29747	29747	70418
	Weight	144	200	192	132	211	264	274	406
Complete Assembly 60" Stroke	Part No.	29790	29790	25385	25385	29796	29799	29799	70420
	Weight	691	606	825	705	1081	1420	1475	1995
Mandrel 60" Stroke	Part No.	29791	29791	25387	25387	29797	29800	29800	70422
	Weight	414	237	465	281	660	900	930	1184
Middle Body 60" Stroke	Part No.	29792	29792	25386	25386	29798	29801	29801	70421
	Weight	180	250	240	178	264	330	340	503

How To Order:

Specify: (1) Complete Assembly and Part Number
(2) Size Connection
(3) Length of Stroke

Recommended Spares:

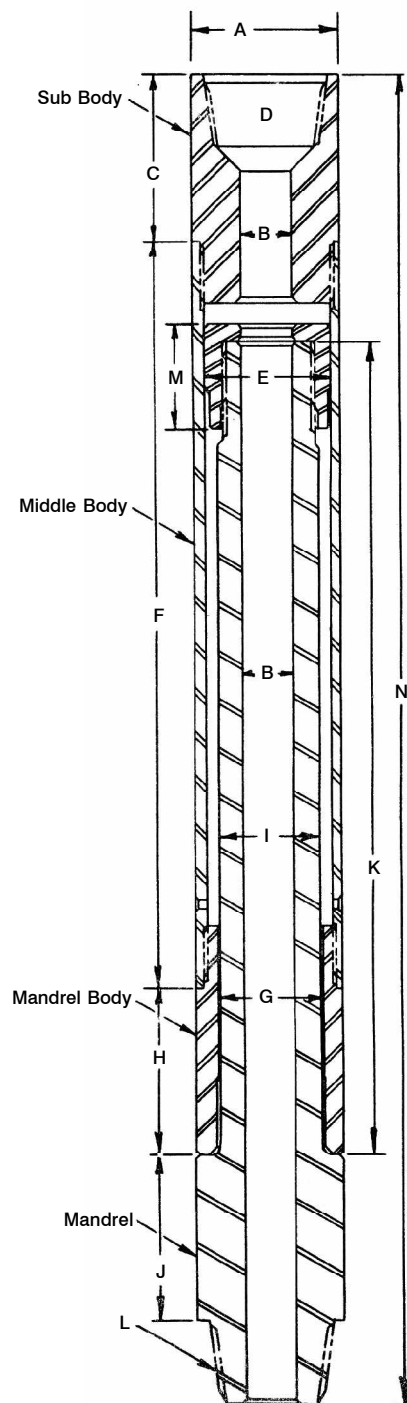
(1) 8 Non-Extrusion Rings
(2) 8 Seal Protector Rings
(3) 16 Knocker Seals

Special Note: Standard Stroke for Bumper Subs is 20";

**Only the Mandrel and Middle Body need be ordered to convert a standard 20" stroke assembly to one of greater stroke. All other parts interchange, for a given size. When a long stroke Assembly is ordered by assembly number, the entire tool is ordered. To convert, order only the Mandrel and Middle Body, by number.*

Bowen Fishing Bumper Sub - Principal Dimensions

Part		Sub Body			Middle Body			Mandrel Body			Mandrel					Knocker			
Key	A	B	C	D	A	E	F	A	G	H	I	B	J	K	L	E	B	M	N
Name	O.D.	I.D. Hole	Outside Length	Con- Necton	O.D.	I.D.	Outside Length	O.D.	I.D. (Hex)	Outside Length	O.D. (Hex)	I.D. Hole	Outside Length	Length (Hex)	Con- Necton	O.D.	I.D. Hole	Length	Over- All
Symbol No. 10120 1-1/4 Ext. Flush	1-13/16	3/8	4	1-1/4 EXT.FL.	1-13/16	1-15/32	28-1/2	1-13/16	1-1/32	3	1-5/32	3/8	3-5/16	28-1/8	1-1/4 EXT.FL.	1-7/16	3/8	4-9/16	41-3/4
Symbol No. 18785 1-1/4 API-REG.	2-1/4	1/2	5-11/16	1-1/4 API-REG.	2-1/4	1-3/4	27-5/16	2-1/4	1-31/64	2-9/16	1-29/64	1/2	5-1/2	26-3/16	1-1/4 API-REG.	1-47/64	1/2	3-1/4	43-9/16
Symbol No. 10175 2-3/8 Ext. flush	2-1/2	1/2	4	2-3/8 EXT.FL.	2-1/2	2	28-1/2	2-1/2	1-15/32	3	1-21/32	1/2	4	28-1/8	2-3/8 EXT.FL.	1-63/64	1/2	4-9/16	42
Symbol No. 10105 2-3/8 API-REG.	3-5/32	1	6	2-3/8 API-REG.	3-5/32	2-39/64	31-3/8	3-5/32	1-29/32	6	2-5/32	1	6	33-1/8	2-3/8 API-REG.	2-37/64	1	5-1/8	52-3/8
Symbol No. 10190 2-3/8 API-I.F.	3-3/8	1	6	2-3/8 API-I.F.	3-3/8	2-13/16	31-3/8	3-3/8	2-1/32	6	2-5/16	1	6	33-1/8	2-3/8 API-I.F.	2-51/64	1	5-1/8	52-3/8
Symbol No. 10090 2-7/8 API-REG.	3-3/4	1-1/4	6	2-7/8 API-REG.	3-3/4	3-3/32	31-3/8	3-3/4	2-5/32	6	2-29/64	1-1/4	6	33-1/8	2-7/8 API-REG.	3-5/64	1-1/4	5-1/8	52-7/8
Symbol No. 10210 2-7/8 API-I.F.	4-1/8	1-1/2	6	2-7/8 API-I.F.	4-1/8	3-7/16	31-3/8	4-1/8	2-17/32	6	2-57/64	1-1/2	6	33-1/8	2-7/8 API-I.F.	3-27/64	1-1/2	5-1/8	52-7/8
Symbol No. 10155 3-1/2 API-REG.	4-1/4	1-1/2	8	3-1/2 API-REG.	4-1/4	3-39/64	31-3/8	4-1/8	2-23/32	8	3-7/64	1-1/2	8	35-1/8	3-1/2 API-REG.	3-37/64	1-1/2	4-7/8	59-1/8
Symbol No. 10170 3-1/2 API-FH.	4-5/8	1-1/2	8	3-1/2 API-FH.	4-5/8	3-39/64	31-3/8	4-5/8	2-23/32	8	3-7/64	1-1/2	8	35-1/8	3-1/2 API-FH.	3-37/64	1-1/2	4-7/8	59-1/8
Symbol No. 10225 3-1/2 API-I.F.	4-3/4	1-1/2	8	3-1/2 API-I.F.	4-3/4	3-15/16	31-3/8	4-3/4	2-27/32	8	3-5/16	1-1/2	8	35-1/8	3-1/2 API-I.F.	3-59/64	1-1/2	5-1/8	59-3/8
Symbol No. 39905 3-1/2 API-I.F.	4-3/4	2	8-1/2	3-1/2 API-I.F.	4-3/4	3-57/64	32-15/16	4-3/4	3-1/8	8	3-1/2	2	8	34-7/8	3-1/2 API-I.F.	3-7/8	2	6-1/8	61-7/16
Symbol No. 10235 4-1/2 API-REG.	5-1/2	2	8	4-1/2 API-REG.	5-1/2	4-25/32	31-3/8	5-1/2	3-17/32	8	4-3/64	2	8	35-1/8	4-1/2 API-REG.	4-49/64	2	5-1/8	59-5/8
Symbol No. 10135 4-1/2 API-FH.	5-3/4	2"	8	4-1/2 API-FH.	5-3/4	4-63/64	31-3/8	5-3/4	3-17/32	8	4-3/64	2	8	35-1/8	4-1/2 API-FH.	4-61/64	2	5-1/8	59-3/8
Symbol No. 10257 4-1/2 API-I.F.	6-1/8	2-1/4	8	4-1/2 API-I.F.	6-1/8	5-9/32	31-3/8	6-1/8	3-25/32	8	4-21/64	2-1/4	8	38-1/8	4-1/2 API-I.F.	5-1/4	2-1/4	5-1/8	59-7/8
Symbol No. 10690 5-1/2 API-REG.	6-3/4	2-3/4	10	5-1/2 API-REG.	6-3/4	5-3/4	34-5/8	6-3/4	4-5/32	8	4-49/64	2-3/4	10	36-7/8	5-1/2 API-REG.	5-47/64	2-3/4	5-1/8	67-3/8
Symbol No. 26595 6-5/8 API-REG.	7-3/4	3-1/2	9-29/32	6-5/8 API-REG.	7-3/4	6-3/4	35-1/8	7-3/4	5-11/64	7-13/32	5-1/8	3-1/2	9-3/4	36-7/8	6-5/8 API-REG.	6-47/64	3-1/2	5-1/8	67-3/16
Symbol No. 61596 7- 5/8 API-REG.	9	4	11-1/2	7- 5/8 API-REG.	9	7- 5/8	36-3/4	9	5-63/64	7-1/2	5-15/16	4	12	37-3/4	7- 5/8 API-REG.	7-39/66	4	6-1/4	73



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* Denotes Manufacturing and Engineering facilities

Downhole Solutions

Drilling Solutions

Engineering and Project Management Solutions

Lifting and Handling Solutions

Production Solutions

Supply Chain Solutions

Tubular and Corrosion Control Solutions

Well Service and Completion Solutions